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Teachers' motivations for initiating innovations

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Abstract This study explores the reasons why teachers introduce innovations into their teaching. Interviews were conducted with thirty teachers in primary, secondary, and university settings in one Midwestern USA community. All participants said they innovated due to a desire to improve student learning; other frequently mentioned reasons were professional development experiences of their own choosing and a desire to avoid personal boredom. Less frequently stated reasons to innovate included the failure of textbooks and experiences with another teacher or the participants' own children. Implications for professional development include encouraging teachers to discover innovations applicable to their own classrooms through providing them with time and autonomy to develop alternative approaches to teaching curriculum.

Keywords Boredom · Innovation · Professional identity · Teacher autonomy · Teacher motivation

Introduction

Uncertainty is the norm in schools. Teachers are never entirely sure how effective their work will be; random events in the school day or in students' lives can easily subvert the most carefully thought-out lessons, and policy mandates might be at odds with the teachers' ideals. Researchers have recognized this characteristic over the decades, referring to teachers' "anxiety" (Jersild 1955, p. 7), teachers' "widespread feeling of uncertainty" (Lortie 1975, p. 132), and the "enervating obligations of endless change" demanded of teachers (Goodson and Hargreaves

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1996, p. 20). How teachers work out—or fail to work out—the uncertainty and tensions in their professional lives affects their motivation and effectiveness (Day et al. 2007) and thus should be considered a foundation for teacher effectiveness studies. Although uncertainty can be a negative working condition, teachers often purposefully create situations which produce still more uncertainty in their jobs. Why teachers create new and uncertain situations is the center of this study. Teachers often experiment with teaching methods or change their roles in the school. This kind of change, or diversification, contributes positively to teachers' professional identities and prevents teachers' career crises (Huberman 1993). Change can have positive effects for teachers overall, but change brings complications because the details of the change process and the final product are both unknowns (Fullan 1999). Complications include needing extra time for developing innovations; teachers may have to justify the innovation to an administrator or navigate skepticism from students, colleagues, and parents or guardians, since school systems at all levels generally do not "encourage or reward dissent from the status quo" (Wolk and Rodman 1994, p. ix). Still, many teachers introduce new ways of teaching despite these difficulties. The question is, why do teachers introduce innovations which can be fraught with uncertainty?

Motivation theories such as control-value and self-determination touch on explaining this question. Teacher identity studies also contribute to the explanation. These ideas expand our understanding, but the reasons why teachers introduce innovations should be investigated through the innovators' own words.

I investigated teachers' explanations for innovating through conducting interviews with 30 self-identified teacher-innovators in one community in the upper Midwest of the United States. I included teachers in elementary and secondary schools as well as teachers at a university in the same community. "Innovation" as used in this study is defined as those initiatives which are new to those who introduce them, even if those initiatives are not particularly creative or radical (Halpin et al. 2004). Innovation for one teacher might be standard practice for others. For the purpose of this study, it was imperative that the teacher's self-perception was of presenting curriculum in unusual, innovative ways. The research question I asked was this: What explains teacher-initiated curriculum innovation?

Background

Theoretical framework

I began this study into teacher-initiated innovations with a background of motivation theories, but I also delved into teacher development and identity studies. These points of view provide a solid backdrop for interpreting the participants' remarks.

Self-initiated change implies motivation—the motivation to put effort into teaching differently than suggested by the textbook or differently than one has taught in the past. Two motivation theories are particularly relevant: control-value (Turner et al. 2009) and self-determination (Deci and Ryan 1985). Control-value

and self-determination theories both contribute to understanding why teachers initiate changes and why teachers might resist changes.

Control-value theory states that perceptions of personal control interact with personal values and that these perceptions influence motivations and emotions. In an education context control-value theory means that teachers will attribute higher values to what they control, will experience positive emotions in association with what they control, and will be more motivated in general due to the ability to experience this control. When teachers perceive control and also value the potential outcome of a change or innovation, teachers are more willing to take the risks of innovating (Turner et al. 2009). This contrasts with imperatives to change which come from school governing bodies. These imperatives are external to the teacher's control; teachers are not likely to value them and may resist these changes. Change efforts need to either include the teachers as the planners of change, or the teachers need to be allowed to adapt the plans to suit their situations (Butt and Townsend 1990).

Control-value theory is basic to the idea of professional agency, or the ability, motivation and opportunity to take action; professional agency has recently been described as a precondition for self-regulative and collaborative learning (Pyhältö et al. 2014). Teachers who demonstrate agency collaborate with others while also assuming responsibility for their own thinking, problem solving, and ways to implement new solutions to problems. They control and value their innovations.

The ideas of professional agency and of control-value theory work in concert with self-determination theory (Deci and Ryan 1985). Self-determination theory suggests that people function optimally when their needs in three areas are met: competence, autonomy, and relatedness (connection at the personal and emotional level, or having a sense of belonging). Martin and Dowson (2009) related this theory to students, proposing that students with a strong sense of relatedness can set for themselves challenging goals and high expectations. Extrapolating and applying this idea to teachers means that teachers who have strong senses of relatedness, competence, and autonomy can then set for themselves challenging goals with high expectations—including introducing innovations. This theory reflects the finding that "teachers who feel competent and valued for that competence are apt to try even harder to improve their performance" (Rosenholtz and Simpson 1990, p. 254). Goodson and Hargreaves (1996) addressed self-determination theory through envisioning teachers' professionalism as teachers operating authoritatively (competence) in collaborative cultures with others (relatedness), exercising discretionary judgment in teaching (autonomy), and being recognized for the high task complexity of their practice (competence).

Teachers who act with this sense of professional agency are related to teachers who are thought of as resistors. Teacher resistance is often termed in the negative as resisting changes suggested by educational or content area experts. Typical of these negative remarks is Waller's (1932/1961): "Programs for the rehabilitation of the schools founder upon the rock of teacher resistance" (p. 457). Waller went on to defend the resistor's point of view, noting the teachers' expertise in knowing the local situation. This knowledge is a key to pulling the best from proposals and modifying them to account for the local people and setting. As Fullan (2007)

pointed out, teachers need to converse about the meaning of change. Teachers need time to examine, discuss, and adapt proposals for their own situations.

Teachers' resistance to change might signify a need to filter changes through a local sieve, but teachers' resistance can also be seen as a resistance to the norm and a driver of innovation. In this sense resistance is a contributor to innovation rather than a resistor of innovation. When a competent teacher resists using one type of instruction, whether suggested by the textbook, the school administrator, or the teacher's own previous practice, perhaps it is due to believing that another design would be more effective. The teacher's understanding of effective education could be deeper than others assume. Textbook authors, for instance, may have written their formats for one type of teacher or one group of students and missed the local opportunities and issues which could easily bring relevance and meaning to the teaching.

Taking a positive view of teacher resistance leads to capturing an analogy to resistance in architectural design. Resistance in architecture implies de-stabilizing the status quo, or resisting uniformity. Resistance applauds local solutions to the universal functions and problems of architecture: holding, spanning, or sheltering. Architectural works have a quality of elegance when they accomplish the function of architecture (holding, spanning, or sheltering) through an act of resistance (capitalizing on the local and unusual) with grace, economy, strength, and modesty enough to not draw attention to the difficulties surmounted (de Botton 2007). Two examples are Frank Lloyd Wright's designs "Fallingwater" and "Taliesin West"; the buildings demonstrate a resistance to the architectural norm and solutions which blend into the local environment. Teacher resistance in an analogical sense is teachers meeting the needs of individuals in the local situation, surmounting the difficulties presented by that group of learners, and using craft knowledge to create an educational design or structure (architecture) which elegantly provides thoughtfully designed scaffolding for learners as they develop their understanding of subject matter and of people.

Teachers' actions (whether compliant, resistant, or innovative) and identities are particularly connected to self-determination and control-value motivation theories. For instance, "relatedness" in self-determination theory is a person's identity as connected to others. Relatedness in the school context, or relationships with pupils and colleagues, could be considered part of the teacher's situated identity (Day et al. 2007). A teacher's situated identity also includes the location of the school and the leadership style at that school, as well as how the school leaders manage issues in teacher resistance, whether positive or negative. Day et al. (2007) separate this situated identity from the teacher's professional identity, which is comprised of the teacher's professional responsibilities and the governing policies. Teachers themselves may not separate the situated identity from the professional (Emo 2010). Rather obviously, teachers have a personal identity as well—their selves outside of their teaching. Whether or not teachers separate their identities into two or three which interact with each other, the teacher's motivation, resilience, and perceived effectiveness are affected by how the teacher manages the tensions in these personal, situated, and professional identities. The "impact of interactions between professional and personal contexts on teachers' development" recently has been

considered as "overlooked in research" (Day et al. 2007, p. 68). In line with this and to shed light on explaining teacher innovations, I bring together the categories of personal, situated, and professional identity with four contributors to teacher development: the teacher's purpose, the culture of teaching, the teacher's context, and the teacher as a person (Fullan and Hargreaves 1992).

The teacher's purpose has been "neglected and underdeveloped as a source of innovation and effectiveness" (Fullan and Hargreaves 1992, p. 5). Professional learning communities are helping to change this, in part because these groups enable teachers to examine their practices, develop their sense of purpose, and discuss innovations with their colleagues. When well run, these communities impact the culture of teaching so that it becomes more collaborative rather than individualistic. Fullan and Hargreaves (1992) separated the culture of teaching from the teacher's context (pupil ages, school location, and school policies), but just as teachers may not separate professional from situated identities, teachers may not see teaching culture and teaching context separately. Combining their professional cultures, contexts, and identities together creates one larger professional identity which includes collegial and pupil relationships, school characteristics, and school policies. In this paper I refer to this one larger professional identity, which reflects how some teachers view their work identities (Emo 2010).

The teacher's personal identity is separate from the teacher's professional identity. The person is important to include in studies on teachers' innovations, since "age, stage of career, life experiences, and gender factors… affect people's interest in and response to innovation" (Fullan and Hargreaves 1992). Day et al. (2007) extend personal identity to include the teacher's home life and personality.

The teachers in this study revealed that they thought of their work in terms of their personal identities and their professional identities, which included remarks in the areas of purpose, context, culture, and situation. The motivation theories of control-value and self-determination provided a backdrop for listening to their remarks on reasons for innovating. Previous research in these areas contributed to my understanding before I conducted the study.

Literature review

Studies of teachers' lives and identities provide additional insights into teachers' motivations to innovate; these works provide more fine-grained rival explanations into the phenomenon of self-initiated innovation. In preparation for this study, I consulted works in motivation theory and in the research field of teachers' lives for plausible rival explanations (Yin 2014) as to why teachers initiate innovations. Rival explanations include:

- the motivation theories of self-determination and control-value, such as the teacher's desire for a degree of complexity (multi-faceted, challenging work) and the teacher's desire to exercise professional autonomy (decision-making),
- issues related to teachers' lives and development, such as the teacher's purpose, the teacher's professional identity, and the teacher's personal identity.

Each of these areas is included in the literature review sections below.

Motivation: Self-determination and control-value

Studies of motivation often address the level of job complexity and the ability to act somewhat autonomously in the professional environment. Through five decades of research, studies consistently show that teachers value autonomy and appropriate challenge (Day et al. 2007; Huberman 1993; Lortie 1975; Ritchie and Rigano 2002; Skaalvik and Skaalvik 2010). Teachers generally are more satisfied with their jobs when they experience greater variation and challenge (Sleegers 1999). Autonomy, the opportunity for the teacher to exercise professional decision-making, is one of the most influential factors on teachers' job satisfaction and self-efficacy (Skaalvik and Skaalvik 2010). A measure of autonomy and a degree of appropriate challenge are not simply motivators for teachers to come to the classroom each day; when teachers have the freedom to make educational decisions and create personal challenges, they are more likely to have a greater commitment toward their jobs and are likely to work hard to improve their competence (Rosenholtz and Simpson 1990). Teachers' job satisfaction is connected with a reasonable level of complexity and the ability to make professional decisions, which certainly reflects control-value and self-determination motivation theory. Teachers are less resistant to reforms required from outsiders if the prescriptions allow teachers to adapt them for their own situations (Butt and Townsend 1990).

The freedom to implement change when the teachers deem it appropriate appears highly influential for teachers' career satisfaction in general. Diversification, change, and new opportunities coincided with these teachers avoiding crises which would otherwise precipitate abandoning teaching. Teachers who diversified ended their careers with a feeling of professional satisfaction and the experience of a harmonious teaching life. These teachers retained their curiosity and enthusiasm, "daring to change" as one experienced teacher phrased it (Grounauer 1993, p. 163).

The influence of factors in teachers' lives and development on innovating

Studies of teachers' self-initiated innovations show that many innovations relate to the teacher's purpose. The teacher's purpose may be related solely to professional identity and considerations such as raising student understanding or interacting with a colleague. The teacher's purpose in innovating can also stem from personal identity, such as having a desire to insert a personal interest into the curriculum. Examples of this variety of purposes include teachers who initiate innovation to "make things interesting and effective for their students" (Hargreaves et al. 2001, p. 193) or to effect social change (Jessness 2002, July; Nieto 2005). Teacher-innovators may have a desire to teach better (Ritchie and Rigano 2002; Schulz 1994) due to curriculum which appears irrelevant (airball 2010, January 5), difficult (McGowan and Graham 2009), or boring for the students (Connelly and Clandinin 1988). Other teachers want to emulate their colleagues (Connelly and Clandinin 1988), which relates to the idea of the teachers' local culture; in this case the teachers had shared their teaching with each other. One teacher mentioned that his

purpose of innovating was to alleviate his own boredom (Ritchie and Rigano 2002); similarly, Swiss secondary teachers stated that they desired to innovate because they wanted to avoid a routinized job (Grounauer 1993, p. 162).

Most of the studies noted here documented only one or a few teachers. When analyzed as a larger body of evidence, the studies did not reveal one common factor within either professional or personal identity which inspired innovation. However, school characteristics (part of the professional identity) can encourage innovation. Some school leaders and school policies encourage pedagogical experimentation; some schools have collegial atmospheres; and some school systems provide for a variety of professional development experiences. Professional development can be helpful to teachers; in a study of 300 UK teachers, professional development experiences had a consistently positive influence on teachers in all stages of work experience, though teachers want these opportunities to be differentiated for their needs and situations (Day et al. 2007). This finding contrasts with a less recent study of 300 Swiss secondary teachers, who generally viewed in-service training as an opportunity for social contact rather than as an opportunity for gaining knowledge or mastering facets of their work which presented problems (Huberman 1993). These differing views are possibly due in part to how the professional development events are organized; those which are collaborative, on-going networks are often more effective learning experiences than those which are lectures. It is unclear how the experiences investigated in these two studies influenced teachers' innovations.

The teacher as a person—who he or she is in terms of age, stage of career, and life experiences—can affect a teacher's interest in innovations (Day et al. 2007; Fullan and Hargreaves 1992; Huberman 1993). While the Huberman study found that teachers with 7–25 years' experience tended to be those who were looking for these new challenges, Day et al. (2007) found those looking for new challenges tended to be teachers who recently conquered their induction phase: those with 4–7 years of classroom experience were ready for new challenges.

Whatever the teachers' years of experience, Huberman identified a "diversification" career stage in which teachers are actively looking for new opportunities, searching for challenges; these teachers are highly motivated and dynamic. If the teacher does not diversify by redirecting his or her career to school leader or to teaching specialist, the teacher experiments with instructional materials, evaluation, and teaching methods. In Huberman's study, 40 % of the teachers said that they had a strong desire for innovation, noting that "they want to renew themselves, to test themselves and their classes with new pedagogical experiments. They are fearful of routine, afraid of going stale in the system" (Grounauer 1993, p. 162). Some innovations may be accounted for through the teachers' strong desires to add some aspect of their personal selves to their professional expertise (Day and Gu 2010; Lortie 1975). It is possible that teachers may wish to exercise creativity, which in itself is a powerful motivating force among teachers (Davies 2006). These studies indicate that teacher boredom may be more influential than commonly recognized. Although boredom in schools has been addressed (Craft 2000; Curtis 2009; Fullan 2007; Heshusius 1994; Leonard 1987), this is usually directed at student boredom and rarely is the teacher's own boredom studied or even mentioned.

Teachers have remarked that scripted curriculum makes them feel undervalued (Bencze and Hodson 1999), and teachers sometimes leave the profession primarily due to too much routine work (Huberman 1993). Boredom implies a lack of curiosity, and curiosity is one of the conditions Maslow identified as necessary prior to fulfilling needs of self-esteem and self-fulfillment. When a condition such as curiosity is thwarted, people react with a threat response (Maslow 1943), which is what Huberman noted in bored teachers: flight—they leave the profession. Thus the personal condition of teacher boredom, or lack of appropriate challenge, became a rival explanation in explaining teacher-initiated innovation.

The intention of this study was to discover if one of the motivators mentioned in previous studies would be confirmed or whether there was another commonality among teachers who innovated in one locality. Would one of the rival explanations prevail? Or would a new explanation develop? The research question for this study was stated as: What explains teacher-initiated curriculum innovation?

Methods

Design

I used an explanatory case study design. Explanatory case studies are those which go beyond description and exploration. They strive to answer a "why" or "how" question (Yin 2014) regarding a phenomenon; in doing so, plausible rival explanations must be identified and considered. These studies describe a case, consider alternative explanations, and present conclusions which are congruent with the facts of the case (Harder 2010). Explanatory studies present theories which may explain the phenomenon. In this study, those alternative explanations include self-determination and control-value theories in addition to the explanations that teachers innovate due to a factor which is part of their personal or professional identity. Those rival explanations, or factors which appeared mostly likely to motivate teachers to innovate, were to effect social change, improve the match between curriculum and students, emulate a colleague, or avoid routine for themselves. Other possibilities were that teachers had a desire to add something personal to their classes or that they simply wanted to exercise creativity.

The explanatory case study method has not been well documented in terms of a procedural formula (Yin 2014). The explanation of a phenomenon could result from iterations of the following: making an initial explanatory proposition, comparing initial findings of one case to that proposition, revising the proposition, comparing other details of that initial case to the revision, and comparing the revised explanatory proposition to findings from additional cases. In this study, the phenomenon was that teachers do innovate in their presentations of curriculum even when they have professionally developed and marketed materials, such as textbooks and text supplements. No one explanation (or proposition) discovered in the literature review seemed to apply to all documented cases in the readings, but all were kept in mind as the study proceeded. Due to these multiple possible explanations, the design needed to be flexible enough to identify a variety of

motivations and through that possibly identify a theory of motivation for teachers' innovations.

The case study was composed of interviews with multiple individuals. The interviews were designed to uncover why the teachers innovated, the benefits that resulted from those innovations, how the teachers were affected by those innovations, and whether or not there were common identity characteristics among the participants.

Interviews with teachers who self-identified as innovators ensured that the data were based on the teachers' own perceptions, motivations, and experiences, rather than the perceptions of their supervisors, their students, or their colleagues. The teachers' own insights were critical to the study design. Each interview was transcribed shortly after taking place and was analyzed at that time for general trends and remarks which fit into previously identified explanations or for statements which communicated a new rival explanation.

Participants

The interviewees were all part of the larger context of one community, a large rural town in the Midwest of the United States. The participants taught academic subjects in primary, secondary, and tertiary schools in this one community, and all had standard textbooks available.

The schools were all of middle size when compared to other schools in the United States. The tertiary school in this town, a land-grant university, has a focus on science and agriculture; it enrolls about 12,000 students each year. The elementary and secondary schools belong to one school district. The elementary schools enroll about 500 students each year and feed into the secondary schools (one grades 6–8 and one grades 9–12) which enroll about 700 students each year. Standardized test results from the primary and secondary schools in the year previous to the study indicated that students in all identified groups within these schools had met adequate yearly progress in both reading and mathematics. Testing in the year of the study indicated concerns for students with disabilities in mathematics (all grades) and in reading (grades 6–8) ("No child left behind 2009 report card" 2010). Overall the attendance rate at these schools was 95.8 % and the graduation rate from secondary school was 90.4 %. None of the schools was noted as particularly distinguished or unusual in teaching methods or student achievements, and there was no particular focus on any one teaching method in these schools.

All teachers of academic content in the K-12 schools in this one community (111 teachers) were invited to participate in face-to-face interviews regarding teaching innovations which they initiated on their own, as opposed to changes which were required of them. Of those contacted, 22 responded. An additional eight participants (4 K-12 teachers and 4 university teachers) joined the study when they learned of it from other participants. None of the volunteer participants were rejected from inclusion in the study group. The resulting 30 participants taught in a variety of settings: 15 in grades K-5 (primary), 11 in grades 6–12 (secondary), and 4 in a university (tertiary). The K-12 participants taught academic content areas (literacy,

mathematics, the sciences, and the social sciences), and the university faculty members were teacher educators. This group of teachers self-identified as presenting curriculum in ways which were unusual and not included in their textbooks.

Literature in the lives of teachers revealed that innovation might be related to the stage of a teacher's career (Huberman 1993; Rosenholtz and Simpson 1990), so teachers' career stages were also noted. Four participants had taught 0–3 years; one had taught 4–7 years, five had taught 8–15 years, seven had 16–23 years, ten had taught 24–30 years, and three participants had taught for more than 31 years.

Twenty-four women and six men volunteered for inclusion in the study. This is close to the same percentage of male and female teachers in the primary and secondary schools and also reflected the percentages of males and females in the university departments represented in the study. All teachers, including those at the university, had formal curriculum guides and all had textbooks.

Procedure

In an explanatory case study design, the researcher usually develops an initial explanation and then compares that initial explanatory proposition to the study findings. In keeping with this tradition, in this study I first established the rival explanations (motivation theories and concepts from teacher identity studies). I then conducted the interviews; between interviews I analyzed the interview data and compared the findings to the initial explanatory proposition.

Data collection

I interviewed the 30 participants at the time and location of their choice. The interviews averaged 33 min long and were conducted over 12 consecutive weeks. In an effort to capture the teachers' perspectives on innovation and their motivation for innovating, I followed the general interview guide but also followed the teachers' conversational leads. I audio-recorded each interview and supplemented the interviews with field notes about the conversations and my impressions; I transcribed both the recordings and the field notes for analysis.

Data analysis

The data analysis began with advice from Bryman (1988): "ground investigations in people's own understandings of social reality" (p. 10). I began refining the explanations of why teachers initiate innovation before all interviews were completed and continued during further field work. Each interview was transcribed shortly after taking place and was analyzed at that time for general trends and remarks which fit into previously identified explanations or for statements which communicated a new rival explanation. I analyzed each transcript with an attitude of looking for the uniqueness of each teacher's story, making a conscious effort to read each as new and individual and letting each interview speak for itself (Seidman 2006). At the same time that I attempted to read each story as new, I made connections to other teachers' stories, finding relationships and common qualities in

their comments. This analysis confirmed most (but not all) of the previously identified explanations, provided new explanations, and added strength and insights within previously identified explanations.

Some teachers brought in much about their personal identities and pasts and life philosophies; others did not elaborate much on their lives and the connections to their innovations. Themes which were initially evident were the statement "I love my job" and comments about being motivated to innovate due to a desire to engage students. Closer analysis showed that the following themes emerged from the data:

- the desire to create high-interest lessons and units,
- the motivation of their positive relationships with pupils,
- comments about learning theory,
- the teachers' personal boredom in the classroom, and
- the teachers' own enjoyment of having fun while teaching.

Some statements were made by only a few teachers but communicated an issue of significance to those teachers, such as the influence of their own children upon their teaching innovations. These connections are further developed in the results and discussion sections below.

Results

The results section reveals the teachers' responses as they fit into the teachers' professional or personal identities. The results are addressed in the order which appeared most significant to the participants.

The teacher as professional

The teachers in this study noted that they innovated in order to be more effective. No discernible patterns emerged which connected teachers' years of experience or situated environment to their comments regarding effectiveness. This section includes their remarks about two general sources of inspiration to innovate: teaching effectiveness factors and factors related to their local situations and experiences.

The desire for perfection in teaching

The first component which Fullan and Hargreaves (1992) stated in their list of what should be considered in teacher development is the teacher's purpose. All teachers in this study stated that a purpose for innovating was to improve their students' learning and perfect their teaching. The teachers felt that lecturing and following the textbook plans did not meet their students' learning needs. They innovated to improve student learning and in many cases to counter poor textbook quality. None of the teachers interviewed stated that they wanted to effect social change through their innovations.

All of the teachers stated that they innovated due to a desire to improve their students' learning. About half of the teachers (16) kept this remark generalized, using terms such as "improve understanding." The other 14 teachers elaborated on this point through defining improved student learning with a variety of terms, such as increasing student interest (13) or ownership (12), creating memorable learning through fun lessons (12), or providing an applied activity (9). Eight teachers each cited student learning styles, discovery learning, or appropriate levels of instruction. Three teachers each noted their desires to have students work in groups, to decrease student anxiety, or to provide positive structure to long class periods.

While five participants mentioned that textbook quality had improved recently in mathematics and science, 12 other teachers mentioned the failure of textbooks in either quality or content. These negative remarks were in mathematics, science, social studies, and literature at both elementary and secondary levels. Literature/reading teachers did not critique the quality of the reading selections but rather referred to the low-level analysis that the texts required from the students. All social studies teachers mentioned that they did not want to use the text on a daily basis. Below are representative comments.

> The questions in the lit book are—I'm sorry, just pass the questions up in our lit book. I don't, I don't—they just don't do it for me (Marcie[1]).

> The basal [reader] which we were told to use just doesn't go in-depth enough. I use class sets [of books instead] (Lianna).

These remarks about textbooks are particularly interesting in light of the current interest in "close reading of text." Participant teachers were already aware of their texts' lack of high-level analysis and changed their classes to account for this before the topic of low-level analysis became popularized.

Three teachers said that not all the state standards for their classes were included in the textbook (upper elementary mathematics, secondary science, and secondary social studies). Two teachers' remarks relative to standards and textbooks are below.

> I had to make up the entire… unit on my own…. I guess there's not a textbook out there that goes through what we do here (Sam).

> You can't be a textbook teacher anymore in order to meet the standards…. You have to be creative while teaching. I have completely thrown out my math series (Janine).

Changes in state standards compounded the difficulty of using a textbook and demanded that some teachers innovate. For instance, at the time of this study the standards in secondary science had changed several times in the previous 8 years and were slated to change yet again, but texts were purchased only once every 6 years.

The literature review indicated that sometimes teachers are inspired to innovate due to a desire to effect social change (Jessness 2002; Nieto 2005). None of the

[1] All participant names are pseudonyms.

teachers in this study said that they had a purpose of influencing social change, and none of the teachers said that their innovations were intended to address social inequities.

Professional learning experiences

While all the teachers in this study remarked that they introduced innovations in order to improve student learning, this purpose was often inspired by the teachers' local teaching culture or situation. More than half the teachers in this study were inspired to innovate due to a formal professional learning experience of their own choosing; informal conversations and relationships with colleagues inspired other teachers. A few teachers introduced innovations in order to adjust to changes in their class schedules or technologies which became available to them. Each of these factors is explored in separate sections below.

Formal learning experiences inspired innovations for more than half the teachers (19 of 30 participants). Seventeen teachers cited learning experiences which were those of their own choosing, rather than sessions required by the school administration. The remaining two mentioned the influence of their teacher education programs. Influential professional development experiences included week-long workshops, short sessions at national-level subject area conferences, lectures at local events, and a 3-year program which combined workshops with an online network. No one type of learning experience dominated the teachers' remarks. Representative comments about the teachers' applications of their formal learning experiences are below.

> [The presenter's evidence for effectiveness] was all the justification that I needed. If it engages them more than what I am doing, then I should be doing it (Clark).

> I really liked the connection that we had made… this summer [in the workshop]…. I really thought it would work out well for them [the students] (Risa).

> It's going to require a lot more synthesis, a lot more evaluation, a lot more application (Kurt).

Funding for professional development in all the schools, including the university, had decreased in the decade prior to the study, so with the exception of one teacher's grant-funded conference experience, these classes, workshops, and conference meetings were funded largely by the teachers themselves. Most of these experiences were classes with university credits offered (continuing education experiences measured with university credits are influential for many teachers in the United States since salaries are tied to number of credits earned beyond the initial licensure).

Two teachers referred to specific experiences during their initial licensure programs as influential on their efforts to teach in ways which are not presented in their textbooks. The teachers who cited their teacher education programs, Lianna and Steve, were licensed within the previous 8 years and had fewer years of

classroom experience than 23 of the other 28 teachers in the study. Steve's mathematics preparation program proposed teaching mathematics vocabulary; for Lianna, the influence was in reading and in science.

> My inspiration for teaching with novels and with inquiry-based science is that I thought that was the only way to teach…. we [students in the teacher education program] were shown the basal readers and looked at them for about 20 min, and then we were told what we could actually do instead (Lianna).

More than half the teachers in this study cited formal learning experiences as influential in their innovations, and this certainly interacts with their desires to improve student learning. Informal learning experiences also influence teachers' innovations, as seen in the next section.

Five teachers noted another teacher's influence as inspirational for their own innovations. There were three forms of influence: conversation between colleagues, a colleague's need for subject area knowledge, and a teaching example recalled from past experience. In all remarks cited in this section, the teachers' desire to improve student learning again comes to the forefront.

Participant Jane cited a conversation with an art teacher as the basis for using crayons in grammar class. Steve cited a conversation with a reading teacher as a catalyst for teaching vocabulary skills in his algebra class; this conversation reminded him of what he had learned in his teacher education program and he then began to more intentionally teach mathematics vocabulary. One of the teachers in Danielle's fourth grade team was new to the state and did not know state history, which she was required to teach. This need for subject area knowledge resulted in this team writing a grant which enabled them to travel around the state gathering materials and resources such as soil samples, interviews, and photographs which would enhance both the teachers' knowledge and their teaching. These resources formed the basis on this team's teaching innovations. Danielle remarked,

> It's been probably the best thing that happened to my teaching…. What we basically did was threw out the textbook and looked at our curriculum guide. Instead of teaching rocks and minerals, we taught rocks and minerals of [our state] (Danielle).

Unlike the others whose conversations with colleagues inspired innovation, Larry cited the influence of his own high school science teacher as influential in his own teaching.

> I think that part of that [reason I use investigative methods] was… a really good science teacher in high school. And she never used a textbook…. We were doing a lot of laboratory kinds of things, a lot of investigative things, and she, she always seemed to ask the right question for us to, to be more interested in what we were doing (Larry).

Teachers clearly can influence each other's teaching and innovations in unplanned ways. This influence occurred in professional learning communities as Danielle's team formed, in casual conversation with each other, and simply through example.

Collegiality, or deepening social-professional relationships

Danielle's team formed a professional learning community; networking opportunities like these which provide social contact with others influenced the innovations of just over half of the teachers in this study. The opportunity to participate in a social-professional network such as a local, state, or national-level professional learning community was a motivator for 16 of the 30 teachers in the study. For instance, Missy was asked to join a group which was developing lessons in connection with a national-level grant. Below are examples of other teachers' comments about the social-professional opportunities their innovations provided.

> We [three] like doing things together (Risa).
>
> We're together on every single thing, practically, which is probably not very common but is very nice (Mary). Very, very nice (Stephanie).
>
> [Another teacher] and I made it a goal to attend at least one workshop [on a new topic] every year. And we often went together (Jane).

In these instances, most remarks regarding collegiality connected to deepening their relationships with one or two other teachers, rather than joining a large network. None of the teachers stated that a social-professional relationship was necessary to their innovations; they saw the social connections as a bonus benefit for themselves rather than a requirement prior to change. It is possible that a teacher might want to join a group of innovators, thereby establishing a sense of superior group belongingness or a sense of elitism. This did not appear as influential for the teachers in this study. Rather, the opportunity to interact with their colleagues was the influence on initiating innovations. None of the participants mentioned any relationship of innovation to career advancement.

External changes

Six teachers were prompted to introduce innovations due to changes outside of their control. Three teachers were prompted to change their teaching because the state standards had changed; these teachers' remarks are detailed in the section on textbook failure in the section on purpose. The other three of these six teachers were told to convert their 1-h classes to 3-h sessions; these teachers abandoned their previous lecture-based format in favor of activities combined with discussions. Two of these teachers, Kurt and Kristina, remarked at length on how this external change catalyzed their innovative approach to teaching. Kurt had several months to consider possible approaches to teaching a 3-h section of his course, and he was pleased with how he managed to adapt the narrative teaching strategy "Storyline" to fit his university course. Two weeks before the semester began, Kristina was asked to teach a section of this course. She elaborated on her resistance to the external change and how collaborating with Kurt alleviated her resistance. She admitted that at first her innovation was "a survival thing" since she did not have much time to plan.

> I didn't have the time to design it myself; I liked the way it had been before, and I was mad that it was different…. [Then] I thought, "Okay, this is the new way. And this [teaching strategy] is, it connects with methodologies that I like, so it's going to be kind of fun. And Kurt's fine to work with." He was willing to share-, and I just thought a lot of his [plans]. In terms of the survival, it was there for me (Kristina).

Kristina provided insight into her process of resisting the external change, collaborating with a colleague in order to survive the change, and adapting the colleague's plan to fit her own teaching preferences. She noted first how the new approach connected with her teaching philosophy. She realized that she also anticipated having fun, which she had not expected when first asked to take on a section of the class. In a later conversation, Kristina revealed how much she enjoyed the innovation and hoped that she would be asked to teach the extra section again the following year.

New technologies

Three teachers mentioned that their innovations involved changes in how they used technology. All three noted a connection between the use of technology and student engagement. Two comments are below.

> I'm not stuck at the board, and that's what I love about [my wireless tablet]. It's centrally located, it's color, it's what they're used to. They gotta [sic] be entertained. It's flashy; they like it; they know how to use it (Steve).

> [Technology] has had a tremendous impact on my teaching… Having the [laptops] has been phenomenal…. [My math students] are not pencil and paper kinds of kids. They need to be more involved with their math. We use a lot of manipulatives but technology can be one of those manipulatives…. Their willingness to do it is far greater (Janine).

Technology certainly provides access to new ideas; in the past, this was provided through print sources. The first-year teacher, Sam, mentioned a particular website he accessed frequently. Two of the most experienced teachers in the study remarked that some of their early ideas for new ways to teach came from teachers' magazines. No other teachers in this study mentioned teachers' magazines or teachers' websites as influencing their innovations.

It is rather difficult to separate, in reality, the teacher's purpose of improving student learning from what occurs in his or her situation, such as either formal or informal learning, changes in the teaching culture, such as changes in class length, subject standards, or available technology. This study reports what the teachers who innovate see as their primary inspiration for innovation. Their attributions may reflect what they hear in professional development experiences, but they also reflect who they are as people—their own needs for challenge, their views of their own identities, and their children. These influences are explored in the following section: the teacher as person.

The teacher as person

The teacher's professional identity, which includes the local situation and the overarching policies, can cause the teacher to initiate innovations. In this study, many participants innovated due to their professional identities, and many of the participants developed innovations due to their own personal needs and identity. No discernible patterns emerged regarding teachers' years of experience, age, or gender. Participants desired to avoid boredom, to continue attending to their identities as people who enjoy change, and to incorporate ideas gained from interactions with their own children.

The teacher's boredom

Teachers in the study said that their innovations began due to realizing their own boredom. For some, this realization was a catalyst; their personal boredom needed to be dealt with immediately. Others said that avoiding their own boredom was a more general motivator, rather than a catalyst, for innovation. Seventeen of the 30 participants cited personal boredom as either the first or second most influential factor in deciding to initiate an innovation. Five of these mentioned that the realization of boredom occurred during their first 3 years of teaching. Mentioning personal boredom was more common for those who taught at least one repeated sections of their classes (13 of 17). Two examples of the early realization of personal boredom are reproduced below.

> If you had to do that *all year long* [speaker's emphasis], you know, do the vocab, do the worksheet, do the story, I mean, how boring is that for you as a teacher? (Diana, teacher candidate).

> It took every noon hour for a year and part of a summer [to write our curriculum]. And we were willing to do that, because we were just bored with what we were doing…. We couldn't stand it anymore (Tia, reflecting on her second year).

Teachers noted that their personal boredom with textbook materials probably reflected what their students felt about the textbooks. The teachers' own boredom served as the catalyst for introducing innovation, but the teachers' statements also showed an awareness of their students.

> [Regarding the textbook] I thought, "I'm bored with that!" So what would I expect out of my students? (Lianna).

> Boring sentences of the same kind, over and over again… When I'm looking to see how many more sentences are in this section, imagine what they're [the students are] doing (Stephanie).

The teachers' remarks about their own boredom with the materials demonstrated that they were also aware of the potential for student boredom. This certainly related to their desire to teach "better" as discussed in the purpose section above, but the boredom the teachers emphasized was their own. Teachers also remarked on how

the lack of boredom in their jobs influenced their career satisfaction. Two comments on this are below.

> Creativity is what keeps me in education. It is never boring (Janine).

> I am *so* not bored [because I am able to innovate] [speaker's emphasis] (Sara).

The boredom issue was not addressed specifically in the interview guide. As a result, it is entirely possible that this factor is more influential than the data indicates.

Personal identity as enjoying change

Participant Sara mentioned a lack of boredom in her job; she and three other participants who also mentioned boredom elaborated on this point. These four communicated that they had personal identities of particularly enjoying change and creating challenges for themselves in the classroom. Their situations and backgrounds varied: they had attended universities in different states for initial teacher training, had differing years of experience, and taught different subjects to learners of different levels. The remarks below reveal the preference for change and challenge that some teachers "own" as part of their identities. All four mentioned that they noticed this even in their first years of teaching.

> [Right from the start] I was going to come in and do everything differently. And I did,… trying to reinvent every wheel…. I'm kind of a maverick, you know. I don't want to do things like everybody else…. I can't tolerate the sameness. I actually like change (Clark).

> I really like new challenges, I really like changes. I find that I get bored doing the same old thing with any couple of years. So I've always enjoyed doing new things. In fact, if I were going to fault myself for anything, it would be for doing too many new things (Kurt).

For these four teachers, teaching implies innovation, and this identity was one that they had when they started their education careers. They did not make particular remarks about the influence of professional learning communities or the influence of their colleagues.

The teacher's own children

Teachers' own boredom and their perceived identities as enjoying change and challenge did influence their innovations. Teachers' own children also provided inspiration to innovate. These particular remarks were made with a stronger degree of emotional strength than were the teachers' remarks which fit into the professional identity group of comments. The remarks below reveal the influence of the teachers' own children on their innovations, as mentioned by five participants.

> I felt confident in my teaching, but I evolved as a teacher because of having my own kids. Two out of my four kids are dyslexic. My seventh-grader is a

> very visual thinker…. So the main challenging question for me is, "How do I meet the needs of individuals?" (Greta).

> I asked my kids, "What do you remember about seventh grade English?" And our older son… said, "I remember that 'not' is never a verb." And I said, "Why do you remember that?" And he said, "Because Miss, Mrs. Taylor does a dance." So she is the one who taught me the "Not is Never a Verb" dance [and caused me to incorporate more engaging active learning] (Jane).

Two teachers were inspired to change their teaching because of their daughters' high ability. Sara's daughter inspired her to think critically about creating learning goals for the highly able students. In Jenna's case, her daughter suggested that changes to her teaching could accommodate able but shy students. This remark is below.

> My daughter, she was very smart, but very self-conscious about it, and she would never raise her hand and answer a question…. I started changing the way I called on kids, because of her (Jenna).

The teachers' own children inspired innovations in different areas. These teachers communicated an awareness of pupils' differing needs in terms of strengths and weaknesses, particularly in areas unrelated to specifics in subject-area learning. The teachers benefitted from observing their children's needs in the presentation of information (organization, visualization, activity, and challenge) as well as their own children's social and emotional needs.

Discussion

The main research question was, "What explains teacher-initiated curriculum innovation?" Prior to the study, possible explanations included ideas and theories in motivation and teacher identity. Teachers did communicate evidence in these areas, but some of this evidence was stronger than expected, such as the influence of social networks and personal boredom. Some evidence was unexpected and previously unidentified as an explanation for self-initiated innovation, such as the failure of textbooks and the teachers' reflections on their own children's needs.

Teachers in this study did not explicitly say that they innovated because they wanted to exercise professional agency in line with control-value theory; they also did not remark that their own needs for relatedness, competence, and autonomy were met so they felt free to innovate (in line with self-determination theory). Many did mention relatedness in the form of working with colleagues. The participants did say that they had their administrators' support in exercising professional judgment and making changes which they thought would be of value to their students, even if these innovations brought uncertainty into their teaching. This ability to exercise professional autonomy does support control-value and self-determination theories. Many of the participants paid for their own professional development and put much time into designing the innovations. This supports the position that teachers with working conditions in line with control-value and self-determination theories work

hard to improve their own competence and experience positive careers (Rosenholtz and Simpson 1990; Skaalvik and Skaalvik 2010).

Many teachers in this study chose to innovate as a result of a social-professional opportunity, and other teachers mentioned they innovated due to a colleague's influence. Some participants stated that they worked with others during their innovations and enjoyed that opportunity to interact with others regarding their instructional changes. These remarks show that the teachers were actively seeking professional relatedness, which is a part of self-determination theory. While these remarks suggest that a professional learning community which supports new learning and innovation is helpful, the teachers in this study did not mention the necessity of such a group for their innovative practices.

Control-value and self-determination theories were also evident in the teachers' comments on innovating with the use of the textbooks. They clearly felt that their administrators trusted them to make competent decisions and that they were allowed the autonomy to do so. They disregarded the classroom textbooks in favor of readings and activities which they valued more highly; they adjusted for students' personal needs in ways as simple as how they decided to organize student participation. This finding on teachers' points of view regarding textbook quality is undeveloped in previous research, and the topic provides an area for future investigation. The participants' comments on innovating due to textbook quality demonstrates teachers' analytic thinking, which likely was developed through a culture of trust and solid preparation in pedagogy.

Pedagogical preparation occurred in traditional teacher preparation programs for all these teachers, and the teachers continued learning about their craft through both formal and informal professional development experiences. More than half the teachers in the study cited a formal learning experience as influential in their innovations, but those experiences were of their own choosing. This corroborates the finding that teachers wanted their professional development experiences to be differentiated for their needs (Day et al. 2007). The comments from the teachers about their professional development experiences, whether from formal workshops or from informal conversations with others, show that the teachers were thinking of pedagogy as they were thinking about the possibilities of the innovations. Even the teacher who mentioned her initial resistance to change linked the resulting innovation (inspired by a colleague) to pedagogy. Although more than half the teachers noted formal professional learning experiences as influential, no one form of professional development was more commonly mentioned than another. The one commonality was that the learning event was one which they chose as relevant to their interests and needs. This too shows evidence of control-value theory; what people can control they tend to value. All participants said that their intention was to improve the students' learning.

Motivation theories certainly contribute to understanding teacher innovation, but other factors are influential in teachers' decisions to innovate. Factors identified through examining previous studies included the intention to effect social change, improve the match between curriculum and students, emulate a colleague, or avoid routine for themselves; desiring to add something personal or creative to their classes was also possible. These alternative explanations were included in the study,

but not all arose as influential for these participants. For instance, the purpose of effecting social change was not mentioned by any participant as influential.

It is logical to expect that teachers innovate due to a desire to increase some observable, quantifiable quality about their teaching, such as higher student achievement, or a less quantifiable but influential and usually observable quality, such as higher student engagement. These professional reasons for innovating were mentioned by all the participants; they were focused primarily on pedagogy. However, the study revealed that for more than half the teachers, one of the main influential factors was the teacher's personal boredom. These teachers recognized their personal boredom, meshed that realization thoughtfully with their educational philosophies and the needs of their students, and initiated innovations. This issue of teacher boredom has been less examined in studies in teachers' lives and effectiveness.

The influence of the teacher's own boredom was an unexpected finding, as was the influence of poor quality textbooks. The third surprising finding in this study (and yet quite logical) was the influence of the teachers' own children on their innovations. Although this was not a frequent remark, there was no interview question particular to this issue. Due to the variety of how the children influenced their teacher-parents (challenge, organization, presentation, and classroom interactions), this source of information about pedagogy could easily provide much insight into effective teaching and is an area for further research.

Whether their ideas sprang from their own children, a lecturer, or another teacher, the teachers were thinking of pedagogy. In self-initiating innovations, the teachers increased their task complexity in positive ways for both themselves and their students. This reflects the consistent finding that many teachers seek diversification (Day et al. 2007; Huberman 1993; Lortie 1975). A summary explanation is this: teachers innovate because they desire to improve their teaching; the innovation likely was influenced by a professional learning experience of the teacher's own choosing and was inspired by one or more of the following: the teacher's own boredom, the failure of the textbook, or the teacher's own children.

Limitations

Limiting the motivation framework to the ideas of control-value and self-determination theories prevented a discussion of several other characteristics of motivation. Specifically, I refer to Malone and Lepper's (1987) taxonomy of the intrinsic motivation demonstrated by players of early educational computer games. Game players stayed with tasks longer if the games included the individual motivating elements of challenge, curiosity, control, and imagination and the interpersonal motivations of recognition and (for some) collaboration and competition. It would be quite interesting to explore teachers' remarks on self-initiated innovation using this taxonomy of intrinsic motivation. A preliminary analysis of the study reported in this paper suggests that for these teachers the strongest of the taxonomic elements of motivation were challenge, curiosity, and imagination (all related to teachers' boredom but also related to the desire to engage students) along with collaboration.

The remarks from the teachers who participated in this study should be remembered as influenced by their environment. The participants were in schools which emphasized student achievement as measured by standardized tests. The most recent test results in the K-12 schools showed that all student groups had met the goals for adequate yearly progress. Although the teachers were still participating in an environment focused on test results, there was not a focus on seeing immediate, dramatic improvement in student test scores; there were no constraints due to concerns with test scores. Teachers in higher needs schools could be more encouraged to attempt innovations, or they might be directed to participate in a whole-school improvement program which discourages teacher-led initiations. The teachers in this study were located in schools which do not have a history of challenging social norms and which do not focus on social inequities. A study such as this could easily have different results if it were completed during a time of social unrest or with teachers in schools which are more oriented toward addressing social issues. It is possible that different results would be obtained if participants were nominated rather than self-selecting, if more teachers were included, if controls were added for the type or degree of innovation, or if different textbooks were available. One must be careful in generalizing qualitative studies such as this one to the wider population; it is up to the reader to decide if these results apply to situations with which the reader is familiar.

Implications

The implications of these findings have applications in teacher preparation and teachers' professional learning and suggest areas for further investigation.

Sustainability is the campus-wide focus at my home university. Teacher educators can embrace this term while designing and reflecting on their teacher education programs. A sustainable career in teaching would have teachers develop their identities of "reflective practitioners" with a vision of themselves as curriculum designers rather than curriculum implementers, thinking of themselves as architects who choose to construct elegant ways to hold, span, and shelter learners. This identity will encourage the new teacher to evaluate materials and to innovate in ways which will benefit both themselves and their students. Teachers who see themselves as innovators and curriculum designers rather than reactors to outside influences will likely be more resilient over the course of their careers. Resiliency appears highly influential in teachers' careers, particularly in high stress teaching situations (Day et al. 2007). If the teacher candidates understand becoming reflective practitioners, it is possible that they will enable themselves to have an enjoyable, effective, and sustainable career.

Administrators may find several ideas based on this study and the related literature helpful in leading their teachers into new territory. Findings showed that the teachers acted within control-value and self-determination motivation theories; they felt trusted to make professional decisions and therefore could take action where they felt action warranted. Significant findings in this research were that teachers did innovate in order to improve student learning and often did so as a

result of their own choices of professional development learning, but teachers innovated due to several other influences: the teachers' own boredom, uninteresting or incomplete textbooks, and the influence of their colleagues and their own children. The findings result in several possibilities for school leaders:

- provide teachers the opportunity to choose their own professional development experiences,
- provide teachers with the time to examine textbooks and adapt uninteresting sections or prompts,
- facilitate peer-to-peer conversations about teaching, and
- encourage faculty to reflect on and share their own children's learning.

Finally, school leaders would need to encourage teachers and possibly coach them through "resisting" their status quo or current inertia if the teachers find that the influences and experiences mentioned above suggest that alternative methods and strategies would be more effective.

The findings corroborate some findings about teacher innovation, identity, and change but also advance understanding of teacher innovation: teachers innovate and diversify not only to improve student learning and as a result of professional development but also as a result of their own boredom, the failure of textbooks, and the influence of their own children. These last three factors are more highly influential in teachers' innovations than previously recognized. This study points to the need to better understand teacher boredom as well as teachers' everyday experiences and their influence on teachers' careers and their teaching. Findings on the influence of teacher boredom could provide insights into teachers' careers, teaching philosophies and methods, and student learning. Investigating the teachers' everyday life experiences, such as conversations with others and observations of children outside of schools, could provide insights into teachers' perceptions of learning and teaching and their ideas for improving teaching.

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